

### **REMARKS**

In accordance with the foregoing, claims 1, 2, 4 and 21 are amended, claims 3 and 22 - 48 are canceled without prejudice or disclaimer. Claims 1 - 21 are pending; claims 1 - 12 and 21 are under consideration and claims 13 - 20 are withdrawn from consideration. No new matter is presented in this Amendment.

#### **Rejection of claims 1 and 8 under 35 U.S.C. §102 over Whitney et al.**

At page 3 of the Office Action, claims 1 and 8 were rejected under 35 U.S.C. §102(b) as being anticipated by Whitney et al. (U.S. Patent 4,670,363) (hereinafter, "Whitney"). The Examiner alleged that Whitney teaches an electrochemical cell comprising an electrolyte comprising an alkali salt, a first solvent and a second solvent, where the first solvent can be N-methylpyrrole and the salt comprises  $\text{LiPF}_6$ ,  $\text{LiAsF}_6$ , etc. For the following reasons, this rejection is respectfully traversed and reconsideration is requested.

Independent claim 1 is amended herein to omit formula (2) from the definition of the additive compound. This amendment has the effect to exclude N-methylpyrrole described in Whitney from the genus of additive compounds. Whitney does not teach or suggest any electrolyte having an additive compound according to formulas (1), (3) and (6). Therefore, the rejection should be withdrawn.

#### **Rejection of claims 1, 3 - 4 and 8 - 11 under 35 U.S.C. §102 over Yamamoto et al.**

Also at page 3 of the Office Action, claims 1, 3 - 4 and 8 - 11 were rejected under 35 U.S.C. §102(b) as being anticipated by Yamamoto et al. (JP 08-138735, machine translation and abstract) (hereinafter, "Yamamoto"). The Examiner alleged that Yamamoto teaches a battery comprising an electrolyte comprising an organic solvent such as PC, EC, etc., a salt comprising  $\text{LiBF}_4$ ,  $\text{LiClO}_4$ ,  $\text{LiPF}_6$ , etc. and adding a pyrrole or pyrrole derivative and that Yamamoto teaches an electrolyte comprising 1M  $\text{LiPF}_6$  in PC with 5 vol% of the additive, 2- and 5- dimethyl pyrrole. For the following reasons, this rejection is respectfully traversed and reconsideration is requested.

Independent claim 1 is amended herein to omit formula (2) from the definition of the additive compound. This amendment has the effect to exclude 2, 5-dimethyl pyrrole described in Yamamoto from the genus of additive compounds. Yamamoto does not teach or suggest any

electrolyte having an additive compound according to formulas (1), (3) and (6). Therefore, the rejection should be withdrawn.

**Rejection of claims 1, 3 – 6 and 8 - 9 under 35 U.S.C. §102 over Abraham et al.**

At page 4 of the Office Action, claims 1, 3 – 6 and 8 – 9 were rejected under 35 U.S.C. §102(b) as being anticipated by Abraham et al. (U.S. Patent 4,489,145) (hereinafter, "Abraham"). The Examiner alleged that Abraham teaches a secondary cell comprising THF/LiAsF<sub>6</sub> (1 .5M) and 0.50 - 5.0 vol% of an additive such as N-methyl-pyrrole. For the following reasons, this rejection is respectfully traversed and reconsideration is requested.

Independent claim 1 is amended herein to omit formula (2) from the definition of the additive compound. This amendment has the effect to exclude N-methylpyrrole described in Abraham from the genus of additive compounds. Abraham does not teach or suggest any electrolyte having an additive compound according to formulas (1), (3) and (6). Therefore, the rejection should be withdrawn.

**Rejection of claims 1, 3 – 6 and 8 - 11 under 35 U.S.C. §102 over Hamamoto et al.**

Also page 4 of the Office Action, claims 1, 3 – 6, 8 – 11 were rejected under 35 U.S.C. §102(b) as being anticipated by Hamamoto et al. (JP 2002-124298, machine translation and abstract) (hereinafter, "Hamamoto"). The Examiner alleged that Hamamoto teaches an electrolyte comprising a solvent and one or more kinds of heterocyclic compounds and that Hamamoto teaches that the heterocyclic compound expressed by formula (I) has a Y comprising a nitrogen atom which is substituted by an alkyl group and is present 0.001-0.8 wt%. Hamamoto et al. teaches on pages 5-6, an electrolyte comprising EC/DEC with 1 M LiPF<sub>6</sub>. For the following reasons, this rejection is respectfully traversed and reconsideration is requested.

Independent claim 1 is amended herein to omit formula (2) from the definition of the additive compound. This amendment has the effect to exclude heterocyclic compound expressed by formula (I) of Hamamoto, wherein Y is a nitrogen atom and which is substituted by an alkyl group, from the genus of additive compounds. Hamamoto does not teach or suggest any electrolyte having an additive compound according to formulas (1), (3) and (6). Therefore, the rejection should be withdrawn.

**Rejection of claims 1, 3 – 6 and 8 - 9 under 35 U.S.C. §102 over Takehara et al.**

Also page 4 of the Office Action, claims 1, 3 – 6 and 8 – 9 were rejected under 35 U.S.C. §102(b) as being anticipated by Takehara et al. (JP Patent 2002-359002, machine translation and abstract) (hereinafter, "Takehara"). The Examiner alleged that Takehara teaches an electrolyte comprising a lithium salt and nonaqueous solvent mainly composed of lactone compound and contains 0.1-10 wt% of nitrogen- containing aromatic heterocyclic compound that can be a pyrrole such as 1-methyl pyrrole, 1-phenyl pyrrole, etc. The Examiner further alleged that Takehara teaches that the salt can be LiPF<sub>6</sub>, LiAsF<sub>6</sub>, etc. For the following reasons, this rejection is respectfully traversed and reconsideration is requested.

Independent claim 1 is amended herein to omit formula (2) from the definition of the additive compound. This amendment has the effect to exclude pyrrole compounds described in Takehara from the genus of additive compounds. Takehara does not teach or suggest any electrolyte having an additive compound according to formulas (1), (3) and (6). Therefore, the rejection should be withdrawn.

**Rejection of claims 1, 3 – 6 and 8 - 11 under 35 U.S.C. §102 over Okazaki et al.**

At page 5 of the Office Action, claims 1, 3 – 6, 8 – 11 were rejected under 35 U.S.C. §102(b) as being anticipated by Okazaki et al. (JP Patent 4-56079, abstract) (hereinafter, "Okazaki"). The Examiner alleged that Okazaki teaches an electrolyte comprising 0.1-5 vol% of a pyrrole derivative having a methyl group and teaches that the solvent can be PC, EC, etc. and the salt can be LiClO<sub>4</sub>, LiAsF<sub>6</sub>, etc. For the following reasons, this rejection is respectfully traversed and reconsideration is requested.

Independent claim 1 is amended herein to omit formula (2) from the definition of the additive compound. This amendment has the effect to exclude pyrrole derivatives described in Okazaki from the genus of additive compounds. Okazaki does not teach or suggest any electrolyte having an additive compound according to formulas (1), (3) and (6). Therefore, the rejection should be withdrawn.

**Rejection of claims 1 and 8 – 11 under 35 U.S.C. §102 over Osaki et al.**

Also at page 5 of the Office Action, claims 1 and 8 – 11 were rejected under 35 U.S.C. §102(b) as being anticipated by Osaki et al. (JP Patent 62-160671, abstract) (hereinafter, "Osaki"). The Examiner alleged that Osaki teaches an electrolyte comprising PC, LiAsF<sub>6</sub> and a

pyrrole is added and teaches that 1.0 M of LiAsF<sub>6</sub> is used. For the following reasons, this rejection is respectfully traversed and reconsideration is requested.

Independent claim 1 is amended herein to omit formula (2) from the definition of the additive compound. This amendment has the effect to exclude pyrrole compounds described in Osaki from the genus of additive compounds. Osaki does not teach or suggest any electrolyte having an additive compound according to formulas (1), (3) and (6). Therefore, the rejection should be withdrawn.

**Rejection of claim 7 under 35 U.S.C. §102(b) or §103(a) over Yamamoto or Hamamoto or Takehara or Okazaki**

At page 3 of the Office Action, claim 7 was rejected under 35 U.S.C. §102(b) as anticipated by or, in the alternative, under 35 U.S.C. §103(a) as being unpatentable over Yamamoto or Hamamoto or Takehara or Okazaki. The Examiner alleged that since Yamamoto or Hamamoto or Takehara or Okazaki teaches the same electrolyte comprising a lithium salt, an organic solvent and a bisphenol A additive then inherently, the formation of a passivation layer on the surface of the positive electrode must also be obtained. The Examiner further alleged that formation by the additive of a passivation layer on the surface of the positive electrode would have obviously have been present once the Yamamoto or Hamamoto or Takehara or Okazaki product is provided. For the following reasons, this rejection is respectfully traversed and reconsideration is requested.

Contrary to what is alleged by the Examiner, Yamamoto or Hamamoto or Takehara or Okazaki do not teach or suggest bisphenol A as an additive. Moreover, as discussed above, independent claim 1 is amended herein to omit formula (2) from the definition of the additive compound. This amendment has the effect to exclude the pyrrole compounds described in Yamamoto or Hamamoto or Takehara or Okazaki from the genus of additive compounds. Therefore, the rejection should be withdrawn.

**Provisional rejection of claims 1 – 12 and 21 on the grounds of nonstatutory obviousness-type double patenting over claims 1 – 15 of co-pending U.S. Patent Application No. 10/817,761**

At page 3 of the Office Action, claims 1 – 12 and 21 were provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1 – 15 of co-pending Application No. 10/817,761. The Examiner alleged that Application No.

10/817,761 claims, in claims 1 and 5, an electrolyte comprising a lithium salt, an organic solvent and an additive compound that initiates decomposition at between 4V and 5V and is selected from a bisphenol A compound. The Examiner further alleged that Application No. 10/817,781 claims in claims 6- 9, that the additive compound is used in an amount of 0.01-10 wt%, that Application No. 10/817,761 claims in claim 10 that the additive forms a passivation layer on the surface of a positive electrode and that Application No. 10/817,761 claims in claims 11-15, the same lithium salts present in the same concentrations and the same organic solvents. For the following reasons, this rejection is respectfully traversed and reconsideration is requested.

Since U.S. Patent Application Nos. 10/817,761 has not yet been issued as patents, and since claims 1 – 12 and 21 of the instant application have not yet been indicated as allowable, it is believed that any submission of a Terminal Disclaimer or arguments as to the non-obvious nature of the claims would be premature. MPEP 804(I)(B). As such, it is respectfully requested that the applicant be allowed to address any obviousness-type double patenting issues remaining once the rejection of the claims are resolved and/or U.S. Patent Application No. 10/817,761 is indicated as being in condition for allowance.

**Rejection of claims 1 – 2, 7 - 12 and 21 on the grounds of nonstatutory obviousness-type double patenting over claims 1, 6 – 13, 26 – 27 and 41 of U.S. Patent No. 7,223,500**

At page 3 of the Office Action, claims 1 – 2, 7 – 12 and 21 were rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1, 6 – 13, 26 – 27 and 41 of U.S. Patent No. 7,223,500. The Examiner alleged that U.S. Patent No. 7, 223,500 claims in claim 1, an electrolyte of a lithium secondary battery comprising lithium salts, a first organic solvent and a carbonate-based additive, claims in claims 26-27, that the electrolyte further comprises a swelling-inhibiting additive such as bisphenol, claims in claims 6-7, that the lithium salts are  $\text{LiPF}_6$ ,  $\text{LiBF}_4$ ,  $\text{LiSbF}_6$ , etc. and are present in a concentration of 0.6-2.0 M and claims in claims 11-13, that the electrolyte comprises a first organic solvent such as EC and a second solvent comprises methylpropyl carbonate, methylethyl carbonate, etc. The Examiner took the position that since U.S. Patent No. 7,223,500 claims the same electrolyte comprising a lithium salt, an organic solvent and a bisphenol A additive, then inherently a passivation layer formed by the additive on the surface of the positive electrode must also be obtained. The Examiner further alleged that the formation by the additive of a passivation layer on the surface of the positive electrode would have obviously have been present once the U.S. Patent No. 7,223,500 product is provided. For the following reasons, this rejection is respectfully

traversed and reconsideration is requested.

Claims 1, 2 and 21 are amended to incorporate the limitation of claim 3 that the additive compound is used substantially in an amount of 0.01 to 10 wt%, based on a total weight of electrolyte. Applicants respectfully submit that an additive compound defined by claims 1, 2 and 21 in the specified amount of 0.01 to 10 wt% would not have been obvious over claims 1, 6 – 13, 26 – 27 and 41 of U.S. Patent No. 7,223,500, since claims 1, 6 – 13, 26 – 27 and 41 provide no teaching or suggestion regarding the amount of the additive compound. (Applicants note that col. 3, lines 57 – 67 of U.S. Patent No. 7,223,500 describes that a swelling-inhibiting additive such as propane sultone, bisphenol, dimethylfuran, 1,3-propandiol cyclic sulfate, and N-acetylcaprolactam may be used in an amount of 0.001 to 10% by weight. However, the specification may not be applied as prior art in an obviousness-type double patenting rejection. M.P.E.P. Section 804.II.B.1) Therefore, the rejection should be withdrawn.

**CONCLUSION:**

There being no further outstanding objections or rejections, it is submitted that the application is in condition for allowance. An early action to that effect is courteously solicited.

Finally, if there are any formal matters remaining after this response, the Examiner is requested to telephone the undersigned to attend to these matters.

If there are any additional fees associated with filing of this Amendment, please charge the same to our Deposit Account No. 503333.

Respectfully submitted,

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Date: Dec 10, 2007

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